FULLWELL® Since 2005



杭州烽瑞光电设备有限公司

Hangzhou Fullwell Optoelectronic Equipment Co., Ltd.

COMPANY PROFILE
公司简介

Hangzhou Fullwell Optoelectronic Equipment Co., Ltd. was established in 2005 and is suited in Qimeng Science & Innovation Park, Liangzhu Street, Yuhang District, Hangzhou City. The company is committed to the R&D, manufacturing and sales of FTTH CATV RF video overlay optoelectronic products. We have gained 9 software copyrights certified by the National Copyright Administration and 15 utility model patents issued by the National Intellectual Property Office. Furthermore, we have won the title of Zhejiang Province Small and Medium-sized Technology Company. Fullwell has been recognized as the Yuhang District Science and Technology Enterprise R&D Center by Hangzhou Yuhang District Science and Technology Bureau.

FULLWELL products enable the realization of CATV RF video overlay. At the Huawei China Partner Conference 2024, Fullwell and Huawei jointly provided the soliton for CATV+F5G, which attracted the attention of many participants. Achieving the transmission over 1 fiber with three wavelengths or five wavelengths, which greatly reduces the costs of ODN network splitters, engineering cabling, and manual welding from smart headend to the user end or desktop.

Hangzhou Fullwell continues to increase the investment of the R&D, enhance the innovation ability of the company's own brand products, the technical content of high-tech products, and the market competitiveness of R&D core products. Our products are mainly exported to

Europe, South America and other countries and regions, and serving for global partners and other internationally renowned telecommunications and television operating network companies (ISP). In order to keep up with the home and aboard markets, as well as the needs of optical communication equipment from new and existing customers, our company has designed, developed and manufactured the "FULLWELL" brand series products in recent years, and also provided OEM and ODM to professional operators and distributors.

We lead the market, because we are professional! We will continue to develop and sell premium quality products, and provide customers with optimized solutions and second to none service. FULLWELL is a partner you can always be relied on.

杭州烽瑞光电设备有限公司成立于2005年，位于杭州市余杭区良渚街道起梦科创园区。公司致力于三网融合等系列光电设备的研发、生产和销售，已有9项软件著作权取得国家版权局认证许可，同时国家知识产权局颁发已经有15项实用新型专利和外观专利，并获浙江省科学技术厅认证《省科技型中小企业》,杭州市余杭区科学技术局认定为余杭区科技企业研发中心。

FULLWELL产品使三网融合网络得以实现,在2024华为中国合作伙伴大会行业展台上，全方位展现了杭州烽瑞与华为联合打造广电CATV+F5G组合方案，吸引了众多与会者的目光。让1纤3波或1纤5波都是在同一芯物理光纤上传输，大大降低了从分前端到用户端或桌面的ODN网络分路器、工程布线、人工焊接等成本。。

杭州烽瑞公司将不断增加研发投入，增强公司自主品牌产品的创新能力、高新产品的技术含量；进一步提升研发核心产品的市场竞争力；公司产品主要出口欧洲、南美等国家和地区，产品主要服务于全球合作伙伴等国际知名的电信和广电运营网络公司。为紧跟国内、外市场，以及新、老客户对光通信设备的需要,近年来我公司设计、研发生产了　烽瑞品牌系列产品，并为各运营商、经销商和合作伙伴，提供专业的OEM贴牌加工、ODM定制服务.

因为专业,所以领先!我们将一如既往地研发、销售更满意的产品、更优质的品牌服务，和提供优化网络方案的技术支持。FULLWELL一直是你可信赖的合作伙伴。

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HONOR
荣誉资质


实用新型专利证书


实用新型专利证书


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外观设计专利证书


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商标注册证
FULLWELL


质量管理体系认证证书
杭州烽瑞光电设备有限公司
GB/T19001-2016 idt ISO9001:2015 标准
IAF
IAS
CQA


Quality Management System Certification
HANGZHOU FULLWELL OPTOELECTRONIC EQUIPMENT CO., LTD
IAF
IAS
CQA


浙江省科技型中小企业
证 书
企业名称：杭州烽瑞光电设备有限公司
证书编号：202133010020042
浙江省科学技术厅


HUAWEI
Enterprise Partner
华为企业业务解决方案开发伙伴计划
兹授予
杭州烽瑞光电设备有限公司
认证级解决方案开发伙伴
(ISV/IHV)
有效期：2024年01月18日-2025年02月01日


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华为认证解决方案伙伴
杭州烽瑞光电设备有限公司
2020


华为技术认证书
三网融合直线平台 FWAP-1055H系列
COMPATIBLE


Huawei Technology Certification
xPON & WDM EDFA FWAP-1550H Series
COMPATIBLE


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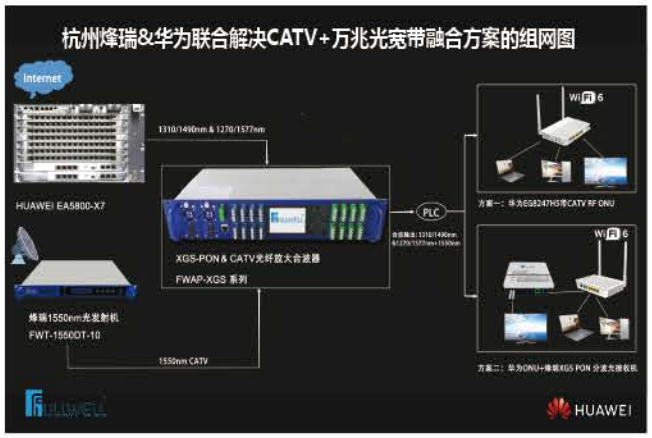

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华为中国合作伙伴大会2024---烽瑞与华为联合打造广电F5G+CATV解决方案

FULLWELL and HUAWEI jointly provide the solution for F5G+CATV RF video overlay---HUAWEI China Partner Conference 2024













XGS-PON & CATV WDM EDFA / Combiner ,前置电源, 8/16/32路光纤放大合波器
FWAP-XGS Series,19"2U Rack Depth:240mm, Front Inlaid Power Supply, Patented Product





Production Description

FWAP-XGS Series is the latest optical transmission system equipment of XGS-PON + CATV FTTH triple play network integration, and it is the function of combining OLT XGS-PON broadband signal and CATV 1550nm optical signal after amplification. Input CATV+ 8/16/32 ports XGS-PON, combined 8/16/32 ports outputs: 1310/1490 & 1270/1577nm + 1550nm. Compatible with XGS-PON OLT, such as HUAWEI, ZTE, and Fiberhome etc, without losing of data, and has a high-cost performance.

Product Features

- FULLWELL patented product with only 240mm chassis depth, Front inlaid power supply, fits for small cabinet.
- Compatible with SmartAX EA5800 Series, achieving GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV+SAT-TV) in FTTH xPON networks.
- Customizable 2X1 optical switch: FWAPS-XGS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, FULLWELL Network Management System Solutions FW2000.
- FWAP-XGS Series is highly recommended to use FULLWELL CATV series FWR-XGS-8610RW, FWR-XGS-8610W, FWR-XGS-1000W, SAT-TV+CATV FWR-XGS-2600W optical receiver, which is cost-effective.

Technical Parameters

Items		Parameter	
CATV operating wavelength	nm	1545~1565	
PON pass wavelength	nm	1270/1577&1310/1490	FWAP-XGS
		1310/1490	FWAP-1550H
Number of uplink optical ports	Ports	8/16/32	
CATV input power	dBm	-10~+10	
Total output power	dBm	30~45	
Each port output power	dBm	10~23	
Difference of each output power	dB	-0.5~+0.5	
Output power adjustable range	dBm	-3~0	
Noise figure (Pin=0dBm)	dB	4.5~5.0	
Input/output isolation	dB	>30	
Pump power leakage	dBm	<-30	
Echo loss	dB	>55	
Network management interface		WEB+SNMP	
Optical connector(PON IN/OUT)		LC/UPC, LC/APC Or SC/UPC, SC/APC	
Power supply	V	90~265Vac	
		-30~ -72Vdc	
Power consumption	W	<70	
Operating temp.	℃	-25~65	
Size(WxDxH)	mm	446×240×86	

Product Series

FWAP-XGS Series: 1310/1490 & 1270 /1577+1550nm
FWAP-1550H Series: 1310/1490 +1550nm

Model	Total output	Output No.	Each Output (dBm)
8x20	31dBm	8	20
8x21	32dBm	8	21
8x22	33dBm	8	22
16x19		16	19
16x20	34dBm	16	20
32x17		32	17
16x21	35dBm	16	21
32x18		32	18
16x22	36dBm	16	22
32x19		32	19
16x23	37dBm	16	23
32x20		32	20
32x21	38dBm	32	21
32x22	39dBm	32	22
32x23	40dBm	32	23

XGS-PON & CATV WDM EDFA / Combiner,前置电源，插拔模块式小机箱,8/16/32 路合波器
19″ 2U Rack Depth:240mm Front Inlaid Power Supply,Plug-in modular XGS-PON WDM EDFA



Production description

FWA20P-XGS Series is the latest optical transmission system equipment of XGS-PON + CATV FTTH triple play network integration, and it is the function of combining OLT XGS-PON broadband signal and CATV 1550nm optical signal after amplification. Input CATV+ 8/16/32 ports XGS-PON, combined 8/16/32 ports outputs: 1310/1490 & 1270/1577nm + 1550nm. Compatible with XGS-PON OLT, such as HUAWEI, ZTE, and Fiberhome etc, without losing of data, and has a high-cost performance.

Product Feature

- FULLWELL patented product with only 240mm chassis depth, Front inlaid power supply, fits for small cabinet.
- Compatible with SmartAX EA5800 Series, achieving GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV+SAT-TV) in FTTH xPON networks.
- Customizable 2X1 optical switch: FWA20PS-XGS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, FULLWELL Network Management System Solutions FW2000.
- Plug-in XGS-PON WDM EDFA module: the pluggable module integrates the laser controlling circuit, the optical path for amplification, and the XGS-PON WDM wavelength division multiplexer, which is easy for maintenance, network upgrading and troubleshooting.

Technical Parameters

Items		Parameter	
CATV operating wavelength	nm	1545~1565	
PON pass wavelength	nm	1270 /1577 &1310/1490	FWA20P-XGS
		1310/1490	FWA20P-1550H
Number of uplink optical ports	Ports	8/16/32	
CATV input power	dBm	-10~+10	
Total output power	dBm	30~45	
Each port output power	dBm	10~23	
Difference of each output power	dB	-0.5~+0.5	
Output power adjustable range	dBm	-3~0	
Noise figure (Pin=0dBm)	dB	4.5~5.0	
Input/output isolation	dB	>30	
Pump power leakage	dBm	<-30	
Echo loss	dB	>55	
Network management interface		WEB+SNMP	
Optical connector(PON IN/OUT)		LC/UPC, LC/APC Or SC/UPC, SC/APC	
Power supply	V	90~265Vac	
		-30~ -72Vdc	
Power consumption	W	<70	
Operating temp.	℃	-25~65	
Size(WxDxH)	mm	446×240×86	

Product Series

FWA20P-XGS Series: 1310/1490 & 1270 /1577+1550nm
FWA20P-1550H Series: 1310/1490 +1550nm

Model	Total output	Output No.	Each Output (dBm)
8x20	31dBm	8	20
8x21	32dBm	8	21
8x22	33dBm	8	22
16x19		16	19
16x20	34dBm	16	20
32x17		32	17
16x21	35dBm	16	21
32x18		32	18
16x22	36dBm	16	22
32x19		32	19
16x23	37dBm	16	23
32x20		32	20
32x21	38dBm	32	21
32x22	39dBm	32	22
32x23	40dBm	32	23

XGS-PON & CATV WDM EDFA / Combiner,插拔模块式小机箱,8/16/32/64路合波器
FWA22P Series,2U Small Rack, Rack Depth:260mm,Plug-in modular XGS-PON WDM EDFA





Production Description

FWA22P-XGS Series is the latest optical transmission system equipment of XGS-PON + CATV FTTH triple play network integration, and it is the function of combining OLT XGS-PON broadband signal and CATV 1550nm optical signal after amplification. Input CATV+ 8/16/32/64 ports XGS-PON, combined 8/16/32/64 ports outputs: 1310/1490 & 1270/1577nm
+ 1550nm. Compatible with XGS-PON OLT, such as HUAWEI, ZTE, and Fiberhome etc, without losing of data, and has a high-cost performance.

Product Features

- FULLWELL patented product with only 260mm chassis depth, fits for small cabinet.
- Compatible with SmartAX EA5800 series, achieving GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV+SAT-TV) in FTTH xPON networks.
- Customizable 2X1 optical switch: FWA22PS-XGS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, FULLWELL Network Management System Solutions FW2000.
- Plug-in XGS-PON WDM EDFA module: the pluggable module integrates the laser controlling circuit, the optical path for amplification, and the XGS-PON WDM wavelength division multiplexer, which is easy for maintenance, network upgrading and troubleshooting.

Technical Parameters

Items		Parameter	
CATV operating wavelength	nm	1545~1565	
PON pass wavelength	nm	1270/1577&1310/1490	FWA22P-XGS
		1310/1490	FWA22P-1550H
Number of uplink optical ports	Ports	8/16/32/64	
CATV input power	dBm	-10~+10	
Total output power	dBm	27~42	
Each port output power	dBm	10~23	
Difference of each output power	dB	-0.5~+0.5	
Output power adjustable range	dBm	-3~0	
Noise figure (Pin=0dBm)	dB	4.5~5.0	
Input/output isolation	dB	>30	
Pump power leakage	dBm	<-30	
Echo loss	dB	>55	
Network management interface		WEB+SNMP	
Optical connector(PON IN/OUT)		SC/UPC,SC/APC Or LC/UPC,LC/APC	
Power supply	V	90~265Vac	
		-30~ -72Vdc	
Power consumption	W	<70	
Operating temp.	℃	-25~65	
Size(WxDxH)	mm	446×260×86	

Product Series

FWA22P-XGS Series: 1310/1490 & 1270 /1577 +1550nm
FWA22P-1550H Series :1310/1490 +1550nm

Model	Total output	Output No.	Each Output (dBm)
8x20	31dBm	8	20
8x21	32dBm	8	21
8x22	33dBm	8	22
16x19		16	19
16x20	34dBm	16	20
32x17		32	17
16x21	35dBm	16	21
32x18		32	18
16x22	36dBm	16	22
32x19		32	19
16x23	37dBm	16	23
32x20		32	20
32x21	38dBm	32	21
64X16		64	16
32x22	39dBm	32	22
64X17		64	17
32x23	40dBm	32	23
64X18		64	18
32x21	41dBm	32	21
64X19		64	19
32x22	42dBm	32	22
64X20		64	20
32x23	43dBm	32	23
64X21		64	21

XGS-PON & CATV+SAT-TV WDM EDFA / Combiner,3U机箱深度260mm,64/40路合波器
FWA22P-XGS Series,19"3U Small Rack, Rack Depth:260mm,Patented Product,专利产品





Production Description



FWA22P-XGS Series is the latest optical transmission system equipment of XGS-PON + CATV FTTH triple play network integration, and it is the function of combining OLT XGS-PON broadband signal and CATV 1550nm optical signal after amplification. Input CATV+ 64/40 ports XGS-PON, combined 64/40 ports outputs: 1310/1490 & 1270/1577nm + 1550nm. Compatible with XGS-PON OLT, such as HUAWEI, ZTE, and Fiberhome etc, without losing of data, and has a high-cost performance.

Product Features



- FULLWELL patented product with only 260mm chassis depth, fits for small cabinet.
- Compatible with SmartAX EA5800 Series, achieving GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV) in FTTH xPON networks.
- Customizable 2X1 optical switch: FWA22PS-XGS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, FULLWELL Network Management System Solutions FW2000.
- FWA22P-XGS Series is highly recommended to use FULLWELL CATV series FWR-XGS-8610RW, FWR-XGS-8610W, FWR-XGS-1000W, SAT-TV+CATV FWR-XGS-2600W optical receiver, which is cost-effective.

Technical Parameters

Items		Parameter	
CATV operating wavelength	nm	1545~1565	
PON pass wavelength	nm	1270/1577&1310/1490	FWA22P-XGS
		1310/1490	FWA22P-1550H
Number of uplink optical ports	Ports	64/40	
CATV input power	dBm	-10~+10	
Total output power	dBm	30~45	
Each port output power	dBm	10~23	
Difference of each output power	dB	-0.5~+0.5	
Output power adjustable range	dBm	-3~0	
Noise figure (Pin=0dBm)	dB	4.5~5.0	
Input/output isolation	dB	>30	
Pump power leakage	dBm	<-30	
Echo loss	dB	>55	
Network management interface		WEB+SNMP	
Optical connector(PON IN/OUT)		SC/UPC, SC/APC	
Power supply	V	90~265Vac	
		-30~ -72Vdc	
Power consumption	W	<70	
Operating temp.	℃	-25~65	
Size(WxDxH)	mm	446×260×130	

Product Series

FWA22P-XGS Series: 1310/1490 & 1270 /1577 +1550nm
FWA22P-1550H Series: 1310/1490 +1550nm

Model	Total output	Output No.	Each Output (dBm)
40x17	35dBm	40	17
40x18	36dBm	40	18
40x19	37dBm	40	19
40x20	38dBm	40	20
64x16		64	16
40x21	39dBm	40	21
64x17		64	17
40x22	40dBm	40	22
64x18		64	18
40x23	41dBm	40	23
64x19		64	19
64x20	42dBm	64	20
64x21	43dBm	64	21
64x22	44dBm	64	22
64x23	45dBm	64	23

FWAP Series,64/128 Ports XG(S)-PON & CATV WDM EDFA / Combiner
3U 64/128路光纤放大合波器





Production Description

FWAP Series is the latest optical transmission system equipment of XG(S)-PON + CATV FTTH triple play network integration, and it is the function of combining OLT XG(S)-PON broadband signal and CATV 1550nm optical signal after amplification. Input CATV+ 64/128 ports XG(S)-PON, combined 64/128 ports outputs: 1310/1490 & 1270/1577nm + 1550nm. Compatible with XG(S)-PON OLT, such as HUAWEI, ZTE, and Fiberhome etc, without losing of data, and has a high-cost performance

Product Features

- Compatible with HUAWEI SmartAX EA5800-X7, EA5800-X15, EA5800-X17, achieving GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV) in FTTH xPON networks.
- Customizable 2X1 optical switch: FWAPS-XGS / FWAP-1550HS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, FULLWELL Network Management System Solutions FW2000.
- It is highly recommended to use FULLWELL optical receiver, such as FWR-8610RW, FWR-8610W, FWR-1000W, which is cost-effective.

Technical Parameters

Items		Parameter	
CATV operating wavelength	nm	1545~1565	
PON pass wavelength	nm	1270/1577&1310/1490	FWAP-XGS
		1310/1490	FWAP-1550H
Number of uplink optical ports	Ports	64/128	
CATV input power	dBm	-10~+10	
Total output power	dBm	30~45	
Each port output power	dBm	10~23	
Difference of each output power	dB	-0.5~+0.5	
Output power adjustable range	dBm	-3~0	
Noise figure (Pin=0dBm)	dB	4.5~5.0	
Input/output isolation	dB	>30	
Pump power leakage	dBm	<-30	
Echo loss	dB	>55	
Network management interface		WEB+SNMP	
Optical connector(PON IN/OUT)	64ports	SC/UPC, SC/APC	
	128ports	LC/UPC, LC/APC	
Power supply	V	90~265Vac	
		-30~ -72Vdc	
Power consumption	W	<110	
Operating temp.	℃	-25~65	
Size(WxDxH)	mm	440x400x130	

Product Series

FWAP-XGS series: 1310/1490 & 1270 /1577 +1550nm
FWAP-1550H series: 1310/1490 +1550nm

Model	Total output	Output No.	Each Output (dBm)
64x15	37dBm	64	15
128x11		128	11
64x16	38dBm	64	16
128x12		128	12
64x17	39dBm	64	17
128x13		128	13
64x18	40dBm	64	18
128x14		128	14
64x19	41dBm	64	19
128x15		128	15
64x20	42dBm	64	20
128x16		128	16
64x21	43dBm	64	21
128x17		128	17
64x22	44dBm	64	22
128x18		128	18
64x23	45dBm	64	23
128x19		128	19

FWR-XGS Series XGS-PON & CATV WDM Optical Receiver
FWR-XGS 系列XGS-PON分波型光接收机





Production Description

FWR-XGS series wave-splitting optical receiver adopts high isolation and WDM technology to separate CATV and XGS-PON ONU signals, which can meet the needs of FTTH fiber to household in CATV + XGS-PON optical network to receive 1550nm CATV signal and output XGS-PON signal: 1310/1490nm & 1270/1577nm.

Product Features

- FWR-XGS series XGS-PON & CATV WDM Optical Receiver Compatible with HUAWEI OptiXstar S890H / P871E XGS-PON ONU, achieving XGS-PON & Wavelength multiplexing of RF video (CATV) in FTTH GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON networks.
- PIN optical receiving power, AGC receiving range: -2 ~ -12dBm, output level: 82dBuv (78dBuv±1, 2 RF outputs).
- Wide bandwidth type: 47 ~ 1000MHz working bandwidth.
- FWR-XGS series XGS-PON & CATV WDM Optical Receiver can be used along with the FULLWELL 1550nm optical transmitter and XGS-PON & CATV WDM EDFA / Combiner for FTTH triple play transmission and coverage.
- Industry-leading 5V power adapter, non-stop working design for more than 5 years.

Technical Parameters

Item		Unit	Parameter
Optical characteristic	Input wavelength	nm	1270/1577 & 1310/1490 + 1550
	Output wavelength	nm	1270/1577 & 1310/1490
	Operation wavelength	nm	1545~1565
	Channel separation	dB	≥40
	Response	A/W	≥0.9
	Receive power range	dBm	+2~-18
	Reflection loss	dB	≥55
	Fiber linker	/	SC/APC
	PON linker	/	SC/APC (Can be customized SC/UPC)
RF characteristic	Bandwidth/flatness	MHz/dB	47-1000/≤±1
	Output level(-2~--12dBm)	dBuv	AGC: 82±1/(1 RF output)
			AGC:78±1 (2 RF outputs, can be customized)
	Output level adjustable Range	dB	0~15 (Can be customized)
	Reflection loss	dB	≥14 (75Ω characteristic impedance)
	RF output interface	/	1 RF output
			2 RF outputs, can be customized
	CNR/MER	dB	≥44/34(PAL-D 60CH, OMI3.8%,-9dBm)
	CTB/CSO/HUM	dB	≥65/≥60/≥60(-1dBm receive)
Other requirement	Power supply/consumption	V/W	External AC100~240V→DC5/2.5
	Working/storage temperature	℃	-35~50/-40~75(humidity 5~90%)
	Size	mm	95×92×23 FWR-XGS-8610RW,Plastic shell
			93×80×25 FWR-XGS-8610W,Metal Shell

Product Series

FWR-XGS-8610RW
Plastic shell XGS-PON & CATV WDM Optical Receiver

FWR-XGS-8610W
Metal Shell XGS-PON & CATV WDM Optical Receiver

FWR-XGS-8610RWU XGS-PON & CATV WDM Optical Receiver with USB Output 5V/500mA
XGS-PON分波光接收机, 带USB供电输出5V==500mA





Production Description

FWR-XGS-8610RWU wavelength-splitting optical receiver adopts high isolation and WDM technology to separate CATV and XGS-PON ONU signals, which can meet the needs of FTTH fiber to household in CATV + XGS-PON optical network to receive 1550nm CATV signal and output XGS-PON signal: 1310/1490nm & 1270/1577nm.

FWR-XGS-8610RWU XGS-PON & CATV WDM Optical Receiver with USB Output 5V/500mA to Power FWG-890G GPON ONU.

Product Features

- FWR-XGS-8610RWU Optical Receiver with USB Output 5V/500mA to Power FWG-890G GPON ONU.
- FWR-XGS-8610RWU XGS-PON & CATV WDM Optical Receiver Compatible with HUAWEI OptiXstar S890H / P871E XGS-PON ONU, achieving XGS-PON & Wavelength multiplexing of RF video (CATV) in FTTH GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON networks.
- PIN optical receiving power, AGC receiving range: -2 ~ -12dBm, output level: 82dBuv (78dBuv±1, 2 RF outputs).
  Wide bandwidth type: 47 ~ 1000MHz working bandwidth.
- FWR-XGS-8610RWU XGS-PON & CATV WDM Optical Receiver can be used along with the FULLWELL 1550nm optical transmitter and XGS-PON & CATV WDM EDFA / Combiner for FTTH triple play transmission and coverage.
- Industry-leading 5V power adapter, non-stop working design for more than 5 years

Technical Parameters

Item		Unit	Parameter	
Optical characteristic	Input wavelength	nm	1270/1577 & 1310/1490	FWR-XGS-8610RWU
			1310/1490	FWR-8610RWU
	Output wavelength	nm	1270/1577 & 1310/1490	FWR-XGS-8610RWU
			1310/1490	FWR-8610RWU
	Operation wavelength	nm	1545～1565	
	Channel separation	dB	≥40	
	Response	A/W	≥0.9	
	Receive power range	dBm	+2～-18	
	Reflection loss	dB	≥55	
	Fiber linker	/	SC/APC	
	PON linker	/	SC/APC (Can be customized SC/UPC)	
RF characteristic	Bandwidth/flatness	MHz/dB	47-1000/≤±1	
	Output level(-2～--12dBm)	dBuv	AGC: 82±1/(1 RF output)	
			AGC:78±1 (2 RF outputs, can be customized)	
	Output level adjustable Range	dB	0～15 (Can be customized)	
	Reflection loss	dB	≥14 (75Ω characteristic impedance)	
	RF output interface	/	1 RF output	
			2 RF outputs, can be customized	
	CNR/MER	dB	≥44/34(PAL-D 60CH, OMI3.8%,-9dBm)	
	CTB/CSO/HUM	dB	≥65/≥60/≥60(-1dBm receive)	
Other requirement	Power supply/consumption	V/W	External AC100～240V→DC5/5	
	USB Output	V/mA	5V/500mA	
	Working/storage temperature	℃	-35～50/-40～75(humidity 5～90%)	
	Dimension	mm	95×92×23	

Product Series

FWR-XGS-8610RWU
XGS-PON & CATV WDM Optical Receiver with USB Output 5V/500mA
FWR-8610RWU
PON & CATV WDM Optical Receiver with USB Output 5V/500mA

FWR-8610 Series PON & CATV WDM Optical Receiver
PON分波型光接收机





Production Description

FWR-8610 Series wave-splitting optical receiver adopts high isolation and WDM technology to separate CATV and PON ONU signals, which can meet the needs of FTTH fiber to household in CATV + PON optical network to receive 1550nm CATV signal and output PON signal: 1310/1490nm

Product Features

- Compatible with HUAWEI ONU, achieving PON & Wavelength multiplexing of RF video (CATV) in FTTH PON networks.
- PIN optical receiving power, AGC receiving range: -2 ~ -12dBm, output level: 82dBuv (78dBuv±1, 2 RF outputs).
- Wide bandwidth type: 47 ~ 1000MHz working bandwidth.
- FWR-8610 Series PON & CATV WDM Optical Receiver can be used along with the FULLWELL 1550nm optical transmitter and PON & CATV WDM EDFA / Combiner for FTTH triple play transmission and coverage.
- Industry-leading 5V power adapter, non-stop working design for more than 5 years.

Technical Parameters

Item		Unit	Parameter	
Optical characteristic	Input wavelength	nm	1310/1490+1550	
	Output wavelength	nm	1310/1490	
	Operation wavelength	nm	1545~1565	
	Channel separation	dB	≥40	
	Response	A/W	≥0.9	
	Receive power range	dBm	+2~-18	
	Reflection loss	dB	≥55	
	Fiber linker	/	SC/APC	
	PON linker	/	SC/APC (Can be customized SC/UPC)	
RF characteristic	Bandwidth/flatness	MHz/dB	47-1000/≤±1	
	Output level (-2~--12dBm)	dBuv	AGC: 82±1/ (1 RF output)	
			AGC:78±1 (2 RF outputs, can be customized)	
	Output level adjustable Range	dB	0~15 (Can be customized)	
	Reflection loss	dB	≥14 (75Ω characteristic impedance)	
	RF output interface	/	1 RF output	
			2 RF outputs, can be customized	
	CNR/MER	dB	≥44/34 (PAL-D 60CH,OMI3.8%,-9dBm)	
	CTB/CSO/HUM	dB	≥65/≥60/≥60(-1dBm receive)	
Other requirement	Power Supply/Consumption	V/W	External AC100~240V→DC5/2.5	
	Working/Storage Temperature	℃	-35~50/-40~75 (humidity 5~90%)	
	Size	mm	95×92×23	FWR-8610RW, Plastic shell
			93×80×25	FWR-8610W, Metal Shell

Product Series

FWR-8610RW
Plastic shell PON & CATV WDM Optical Receiver

FWR-8610W
Metal Shell PON & CATV WDM Optical Receiver

FWR-XGS-1000GSD/ FWR-1000GSD Filter Optical Receiver for XGS-PON / PON & CATV
滤波型光接收机



Production Description

Fiber to the home broadband access is the ultimate development goal, FTTH filtering optical receiver FWR-XGS-1000GSD is the target terminal products for this goal. It selects low optical power receiving and RF technique which can achieve the requirement of FTTH that CATV+GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON optical network receiving 1550nm wavelength in CATV signal, FWR-XGS-1000GSD series is provided with the optical power receiving monitoring indicator LED on the panel (≥-15dBm).

Product Features

- FWR-XGS-1000GSD Can be compatible with any GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF video (CATV) triple play optical network.
- PIN optical receiving power, -1dBm receiving sensitivity, AGC receiving range: -2 ~ -12dBm, output stable level: 82dBuv.
- Wide bandwidth type: 47 ~ 1000MHz working bandwidth.

FWR-XGS-1000GSD can be used along with the FULLWELL optical transmitter and XGS-PON & CATV WDM EDFA for FTTH optical network receiving 1550nm wavelength in CATV signal.

- Industry-leading 5V power adapter, non-stop working design for more than 5 years.

Technical Parameters

Item		Unit	Parameter	
Optical characteristic	PON input wavelength	nm	1270/1577 & 1310/1490	FWR-XGS-1000GSD
			1310/1490	FWR-1000GSD
	Operation wavelength	nm	1545~1565	
	Channel separation	dB	≥40	
	Response	A/W	≥0.9	
	Receive power range	dBm	+2~-18	
	Reflection loss	dB	≥55	
	Fiber linker	/	SC/APC	
RF characteristic	Bandwidth/Flatness	MHz/dB	45~1000	
	Output level	dBuv	82(AGC: -2~-12dBm)	
	Reflection loss	dB	≥14(characteristic impedance75Ω)	
	RF output impedance	Ω	75(RF Output Interface Metric F)	
	MER(Closed Equalization)	dB	≥25(64QAM),≥31(256QAM)	
	MER(Open Equalization)	dB	≥32(64QAM),≥34(256QAM)	
	Bit Error Rate(BER)	/	≤1×10-4	
	CNR/CTB/CSO	dB	≥43/≥54/≥54(-9dBm/Nominal Level)	
	Power Supply/Consumption	V/W	External AC90~250V→DC5/≤2.5	
	Working/Storage Temperature	°C	-25~55 / -40~75	
Other requirement	Working/Storage Humidity	%	5~90(No Condensation)	
	Size	mm	90×60×22	FWR-XGS-1000GSD
			90×60×22	FWR-XGS-8610GSD

Product Series

FWR-XGS-1000GSD / FWR-XGS-8610GSD

Filter Optical Receiver for XGS-PON optical network:
1270/1577 & 1490/1310+1550nm

FWR-1000GSD / FWR-8610GSD

Filter Optical Receiver for PON optical network:
1310/1490+1550nm

Passive XG(S)-PON & CATV WDM Optical Receiver
无源XG(S)-PON分波型光接收机







Production Description

FWR-XGS-1000W is designed as a novel equipment for special requirement of CATV industry. It is catering to object of passive terminal receiving equipment for FTTH 1270/1577 & 1310/1490 + 1550 signals, realizing 1550nm receiving and XGS-PON signals transferring, which FTTH projects combining CATV and XGS-PON signals easier.It is very convenient as just plug and play and also energy-saving. This equipment adopts high isolation WDM & high sensitive optical receiving tube and exchanges 50dBuV analog level while receiving as -9dBm (44dBuV digital level). It is superior fitting for FTTH application in place of faraway village, construction site and etc due to the advantages of powerless, no consumption, economic and flexible

Product Features

- FWR-XGS-1000W XGS-PON & CATV WDM Optical Receiver Compatible with HUAWEI OptiXstar S890H / P871E XGS-PON ONU , achieving XGS-PON & Wavelength multiplexing of RF video (CATV) in FTTH GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON networks.
- Wide bandwidth type: 47 ~ 1000MHz working bandwidth.
- FWR-XGS-1000W XGS-PON & CATV WDM Optical Receiver can be used along with the FULLWELL 1550nm optical transmitter and XGS-PON & CATV WDM EDFA / Combiner for FTTH triple play transmission and coverage.

Technical Parameters

Item	Unit	Parameter	
Input wavelength	(nm)	1270/1577 & 1310/1490 + 1550	FWR-XGS-1000W
		1310/1490 +1550	FWR-1000W
Output wavelength	(nm)	1270/1577 & 1310/1490	FWR-XGS-1000W
		1310/1490	FWR-1000W
Operation wavelength	nm	1545～1565	
Channel separation	dB	≥40	
Response	A/W	≥0.9	
Receiving power range	dBm	0～-12 (advice -1～-6)	
Reflection loss	dB	≥45	
Fiber linker	/	SC/APC	
PON linker	/	SC/UPC(Can be customized SC/APC)	
Bandwidth/flatness	MHz/dB	47～1000/≤±2	
Output Level	dBuv	66 (0dBm receive) -48(-9dBm receive)	
CNR/MER	dB	≥44/34(0dBm), ≥38/29(-6dBm)	
CTB/CSO/HUM	dB	≥70/≥66/≥60 (-3dBm/60dBuv)	
Working/storage temperature	℃	-30～55/-40～75	
Working/storage humidity	%	Humidity(5%-90%) ((No Condensation)	
Dimension	mm	78×60×22.5	

Product Series

Passive WDM Optical Receiver

FWR-XGS-1000W, Passive XGS-PON & CATV WDM Optical Receiver
FWR-1000W, Passive PON & CATV WDM Optical Receiver

Passive Filter Optical Receive

FWR-XGS-1000, Passive Filter Optical Receiver for XGS-PON optical network: 1270/1577 & 1490/1310+1550nm
FWR-1000 , Passive Filter Optical Receiver for PON optical network: 1310/1490+1550nm

CATV EDFA ,插拔模块式小机箱,16/32/64路光纤放大器
FWA22-1550H Series,2U Small Rack, Rack Depth:260mm, Plug-in modular EDFA



Production Description

FWA22-1550H Series is a high-power multi-ports EYDFA with gain spectrum band within 1545~1565nm. It is designed for the application of single channel. This series of EDFA offers a flexible and low-cost solution for CATV large area coverage of metropolises and medium-sized cities.

Product Features

- High quality: adopt multimode large power pump laser, power is optimized reasonably by software, and can maximumly reduce NF of EYDFA, it is comparable with YEDFA. The feature can make system achieve excellent CNR.
- FWA22-1550H Series: Rack Depth: 260mm.
- Plug-in EDFA module: the pluggable module integrates the laser controlling circuit, the optical path for amplification, which is easy for maintenance, network upgrading and troubleshooting.
- Customizable 2X1 optical switch: FWA22-1550HS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.

Technical Parameters

Items		Parameter
CATV operating wavelength	nm	1545~1565
Number of uplink optical ports	Ports	16/32/64/128
CATV input power	dBm	-10~+10
Total output power	dBm	30~42
Each port output power	dBm	10~24
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Input/output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	<70
Operating temp.	℃	-25~65
Size(WxDxH)	mm	446×260×130

Product Series

FWA-1550H Series
FWA22-1550H Series: Rack Depth:260mm

Model	Total output	Output No.	Each Output (dBm)
16x21	34dBm	16	20
32x18	35dBm	32	18
16x22		16	22
32x19	36dBm	32	19
16x23		16	23
32x20	37dBm	32	20
16x24		16	24
32x21	38dBm	32	21
32x22		32	22
64X17	39dBm	64	17
32x23		32	23
64X18	40dBm	64	18
64X19		64	19
64X20	41dBm	64	20
64X21	42dBm	64	21

CATV EDFA ,前置电源, 16/32/64路光纤放大器
FWA20-1550H Series,2U Rack Depth:240mm, Front Inlaid Power Supply



Production Description

FWA20-1550H Series is a high-power multi-ports EYDFA with gain spectrum band within 1545~1565nm. It is designed for the application of single channel. This series of EDFA offers a flexible and low-cost solution for CATV large area coverage of metropolises and medium-sized cities.

Product Features

- High quality: adopt multimode large power pump laser, power is optimized reasonably by software, and can maximumly reduce NF of EYDFA, it is comparable with YEDFA. The feature can make system achieve excellent CNR.
- FULLWELL patented product with only 240mm chassis depth, Front inlaid power supply, fits for small cabinet.
- Customizable 2X1 optical switch: FWA20-1550HS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- It is highly recommended to use FULLWELL optical receiver, such as FWR-8610, FWR-1000, which is cost-effective.

Technical Parameters

Items		Parameter
CATV operating wavelength	nm	1545~1565
Number of downlink optical ports	Ports	16/32/64
CATV input power	dBm	-10~+10
Total output power	dBm	30~42
Each port output power	dBm	10~23
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Input/output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	<70
Operating temp.	℃	-25~65
Size(WxDxH)	mm	446×240×86

Product Series

FWA-1550H series
FWA22-1550H Series : Rack Depth: 260mm
FWA20-1550H Series : Rack Depth: 240mm

Model	Total output	Output No.	Each Output (dBm)
16x21	31dBm	16	20
32x18		32	18
16x22	32dBm	16	22
32x19		32	19
16x23	33dBm	16	23
32x20		32	20
16x24	34dBm	16	24
32x21		32	21
32x22	35dBm	32	22
64X17		64	17
32x23	36dBm	32	23
64X18		64	18
64X19	37dBm	64	19
64X20	38dBm	64	20
64X21	39dBm	64	21

CATV EDFA ,小机箱,1 /2 /4 /8路光纤放大器
FWA22-1550T Series, 1 /2 /4 /8 Ports CATV EDFA,1U Small Rack, Rack Depth:260mm



Production Description

FWA22-1550T Series EDFA (Erbium Doped Fiber Amplifer) is a representative one in the optical amplifier. As the EDFA wavelength is 1550nm, it is in line with the low-loss band of fiber and its technology has been relatively mature, so widely used.

Product Features

- High quality: adopt multimode large power pump laser, power is optimized reasonably by software, and can most maximumly reduce NF of EDFA, it is comparable with EDFA. The feature can make system achieve excellent CNR.
- FWA22-1550T series Rack Depth:260mm, fits for small cabinet.
- Customizable 2X1 optical switch: FWA22-1550TS Series, built-in optical path selector, 2 optical inputs.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- It is highly recommended to use FULLWELL optical receiver, such as FWR-8610, FWR-1000, which is cost-effective

Technical Parameters

Item		Parameter
CATV operating wavelength	nm	1545~1565
Number of downlink optical ports	Ports	1/2/4/8
CATV input power	dBm	-10~+10
Total output power	dBm	13~28
Each port output power	dBm	10~23
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Input/output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	<15
Operating temp.	℃	-25~65
Size(WxDxH)	mm	435×260×45

Product Series

FWA-1550T series

FWA22-1550T series : Rack Depth:260mm

Model	Total output	Output No.	Each Output (dBm)
1550T-19	19dBm	1	19
1550T-20	20dBm	1	20
1550T-21	21dBm	1	21
1550T-22	22dBm	1	22
1550T-2X19	23dBm	2	19
1550T-4X16		4	16
1550T-2X20	24dBm	2	20
1550T-4X17		4	17
1550T-2X21	25dBm	2	21
1550T-4X18		4	18
1550T-2X22	26dBm	2	22
1550T-4X19		4	19
1550T-4X20	27dBm	4	20
1550T-8X17		8	17
1550T-4X21	28dBm	4	21
1550T-8X18		8	18

FWT-1550DT Series 1550nm Direct Modulation Optical Transmitter, 1U Small Rack,Rack Depth:260mm,1550nm直调光发射机



Production Description

FWT-1550DT series of products adopt the high linearity, optical isolation, the DFB, thermoelectric cooling DFB laser produced by AOI and other world-renowned semiconductor companies. It can provide high-quality images, digital or compressed digital signal long-distance transmission for cable television and telephone communications. Built-in RF driver amplifier and control circuitry to ensure the machine's CNR, CTB, CSO target.

Product Features

- High quality: original system optimization control technology and RF pre-distortion technology ensure that the system can acquire the maximum CTB, CSO, and SBS targets in the case of excellent performance CNR .
- Rack Depth:260mm, fits for small cabinet.
- Reliability: The 19 "1U standard rack, plug-in type switching power supply, it can work at 85 ∽ 265Vac City Network Voltage, as well as an optional DC48V power supply. Chassis cooling automatic temperature control.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- FWT-1550DT series 1550nm directly modulated optical transmitter, suitable for 20~50KM long distance transmission.

Technical Parameters

Item	Unit	Parameter
Laser Type	DFB	AOI
Wavelength	nm	1550±10
Optical Modulation		Intensity Modulated
Optical output power	dBm	10 (or 2x6.5)
Optical Connector Type		SC/APC or FC/APC
Frequency range	MHz	47～1000
CNR	dB	≥52.0
Flatness	dB	±0.75
RF input level	dBmV	18～28
Network management interface		WEB+SNMP
C/CTB	dB	≥65.0
C/CSO	dB	≥65.0
RF input impedance	Ω	75
RF Input Return Loss	dB	>16(47～550)MHz >14(550～1000)MHz
Power supply	V	90~265Vac
		-30~ -72Vdc
Power	W	≤10
Working Temperature	℃	0～50
Storage temperature	℃	-20～85
Working relative humidity	%	20%～85%
Size(WxDxH)	mm	435×260×45

Product Series

FWT-1550DT-7, 1 way output ≥7dBm
FWT-1550DT-9, 1 way output ≥9dBm
FWT-1550DT-10, 1 way output ≥10dBm
FWT-1550DT-2x6.5, 2 ways output ≥6.5dBm

FWT-1550EA series C-Band Tunable 1550nm Externally Modulated Optical Transmitter 1528~1563nm adj. or Customized the Wavelength可调波长外调制光发射机



Production Description

FWT-1550EA series C-Band Tunable 1550nm external modulation optical transmitter, is a pioneer and new product from our company which D&R, design and manufacture by ourselves. The tunable range of wavelength: 1528.77~1563.86nm, the adjustable wavelength ＞35nm. With the traditional standard wavelength ±100GHz adjustable, is a completely new concept.FWT-1550EA series including all can using wavelength of C-band. (CATV wavelength valid range: 1540~1563nm) Users can achieve the selection, switch quickly, accurately, convince the selection demand of DWDM system.

Product Features

- Intuitive: The laser is the most expensive machine components, machine equipped with microprocessor monitors the working state of the laser, the panel LCD window displays the operating parameters.
- C-Band Tunable :1528~1563nm adj. or customize the wavelength.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- FWT-1550EA series C-Band Tunable 1550nm external modulation optical transmitter, suitable for 60~200KM long distance transmission.

Technical Parameters

Item			Specification
Optic Parameters	Operating wavelength(adj.)	nm	1528.77～1563.86
	Output power	dBm	2x7~10
	Return loss	dB	≥55
	Optical fiber connector		SC/APC
RF Parameters	Bandwidth	MHz	47~860 (1080)
	Input level	dBmV	23±5
	Flatness	dB	≤±0.75
	Return loss	dB	＞16
	Input Impedance	Ω	75
Link Parameters	Channels		PAL-D/60ch
	CNR	dB	≥53
	CTB	dB	≤-65
	CSO	dB	≤-65
	SBS(adj.)	dB	13~19
General Parameters	Network management interface		WEB+SNMP
	Power supply	V	90~265Vac
			-30~-72Vdc
	Power consumption	W	≤50
	Working Temp	℃	0～50
	Storage Temp	℃	-20～85
	Operating relative humidity	%	5~95
	Size(WxDxH)	mm	435×365×45

Product Series

FWT-1550EA-2X7, two outputs ≥7dBm
FWT-1550EA-2X8, two outputs ≥8dBm
FWT-1550EA-2X9, two outputs ≥9dBm
FWT-1550EA-2X10, two outputs ≥10dBm

FWT-1550ET Series Long-haul 1550nm Externally Modulated Optical Transmitter
远距离传输1550nm外调制光发射机



Production Description

FWT-1550ET series is a model of 1550nm Externally Modulated Optical Transmitter according to the current international industry technique standard. The whole unit light source adopts narrow line width（Typ.=0.65MHz), low noise and continuous wave DFB laser, which is propitious to reduce the influence of dispersion. Adopting LiNbO3 external modulator that is especially designed by JDSU and FULLWELL original micro-wave technology , FWT-1550ET externally modulated optic transmitter can reach high index of CNR≥53dB,47~860 or 47~1080MHz,CTB≤-65dB, CSO≤-65dB,SBS:13 ～ 19dBm adjustable.

Product Features

- High performance: FULLWELL original Micro-wave Source Technology. Adopting RF pre-distortion technology, system get perfect CTB, CSO and SBS index when CNR≥53dB.
- Flexibility: The phase modulation Technology of the modulator boost the input optical power to the utmost, thus reaching long-distance transmission by ensuring excellent system CSO, SBS 13~19dBm adjustable/MGC mode is optional at spot, OMI can be optimized at spot. Suitable for various network.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- FWT-1550ET series Long-haul 1550nm external modulation optical transmitter, suitable for 160~200KM long distance transmission.

Technical Parameters

Items			Parameter
Optic Parameters	Operating wavelength	nm	1550±10
	Output power	dBm	2x7~10
	Return loss	dB	≥55
	Optical fiber connector		SC/APC
RF Parameters	Bandwidth	MHz	47~860 (1080)
	Input level	dBmV	23±5
	Flatness	dB	≤±0.75
	Return loss	dB	>16
	Input Impedance	Ω	75
Link Parameters	Channels		PAL-D/60ch
	CNR	dB	≥53
	CTB	dB	≤-65
	CSO	dB	≤-65
	SBS(adj.)	dB	13~19
General Parameters	Network management interface		WEB+SNMP
	Power supply	V	90~265Vac
			-30~ -72Vdc
	Power consumption	W	≤50
	Working Temp	℃	0～50
	Storage Temp	℃	-20～85
	Operating relative humidity	%	5~95
	Size(WxDxH)	mm	435×365×45

Product Series

FWT-1550ET -2×7, two outputs ≥7dBm
FWT-1550ET -2×8, two outputs ≥8dBm
FWT-1550ET -2×9, two outputs ≥9dBm
FWT-1550ET -2×10, two outputs ≥10dBm

FWT-1550ES Series Standard Type 1550nm Externally Modulated Optical Transmitter
标准型1550nm外调制光发射机



Production Description

FWT-1550ES series Standard type externally modulated optical transmitter, which accords to the current international industry technique standard is a 1550nm Externally Modulated Optical Transmitter. The whole unit light source adopts narrow line width (Typ.=0.65MHz), low noise and continuous wave DFB laser, which is propitious to reduce the influence of dispersion. The whole unit signal modulation adopts CATV special LiNbO3 external modulator of American company and FULLWELL optimized control technology with independent intellectual property, so FWT-1550ES series externally modulated optical transmitter can reach high index of back to back,SBS:13 ～ 19dBm adjustable.

Product Features

- High performance: FULLWELL original Micro-wave Source Technology. Adopting RF pre-distortion technology, system get perfect CTB, CSO and SBS index when CNR≥52dB.
- Flexibility: The phase modulation Technology of the modulator boost the input optical power to the utmost, thus reaching long-distance transmission by ensuring excellent system CSO, SBS 13~19dBm adjustable/MGC mode is optional at spot, OMI can be optimized at spot. Suitable for various network.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- FWT-1550ES Series Standard type 1550nm Externally Modulated Optical Transmitter, suitable for 60~120KM distance transmission.

Technical Parameters

Items			Parameter
Optic Parameters	Operating wavelength(adj.)	nm	1550±10
	Output power	dBm	2x7~10
	Return loss	dB	≥55
	Optical fiber connector		SC/APC
RF Parameters	Bandwidth	MHz	47~860 (1080)
	Input level	dBmV	23±5
	Flatness	dB	≤±0.75
	Return loss	dB	>16
	Input Impedance	Ω	75
Link Parameters	Channels		PAL-D/60ch
	CNR	dB	≥52
	CTB	dB	≤-65
	CSO	dB	≤-65
	SBS(adj.)	dB	13~19
General Parameters	Network management interface		WEB+SNMP
	Power supply	V	90~265Vac
			-30~ -72Vdc
	Power consumption	W	≤50
	Working Temp	℃	0～50
	Storage Temp	℃	-20～85
	Operating relative humidity	%	5~95
	Size((WxDxH)	mm	435×365×45

Product Series

FWT-1550ES -2×7, two outputs ≥7dBm
FWT-1550ES -2×8, two outputs ≥8dBm
FWT-1550ES -2×9, two outputs ≥9dBm
FWT-1550ES -2×10, two outputs ≥10dBm

FWSW-2X1 Optical Switch,2 ways in ,1 way out,光开关2进1出



Production Description

FWSW-2X1 optical switch has an extremely low insertion loss. The main component is imported single-mode optical switch, and adopts MCU intelligent control technology and SNMP network management technology to make the performance better than others. I9" standard chassis is adopted, it can be set automatically, manually and by network management. Random optical power and the chosen state are displayed on the front panel LCD or monitored by network management system. It is applicable to switch of optical path and optical devices which need high reliable operation, such as the 1550nm optical transmitter in front of Cable TV, automatic switch of optical fiber amplifier hot backup, optical routing about key protected optical path, ring net with self-healing. It can also be used to dynamically configured CADM and OXC, system monitoring and fault protection. Switching power supply is draw-out type with structure of aluminum profile extrusion, it helps greatly to cooling and replacement. Besides it can make dual supply cold-heat backup.

Product Features

- Reliability: The 19 "1U standard rack, plug-in type switching power supply, it can work at 85 ∽ 265Vac City Network Voltage, as well as an optional DC48V power supply. Chassis cooling automatic temperature control.
- Switching speed<10mS,2 ways in, 1 way out, main and redundant optical path backup, seamless switching.
- User can define manual or automatic mode. User can define alarm threshold, switch threshold and other parameters.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- Input optical power range: -25~+25dBm, and can define alarm threshold.

Technical Parameters

Item	Unit	Technical parameter
Wavelength	nm	1100~1600nm
input Optical power range	dBm	-30~+27 (can define alarm threshold)
Inserting loss	dB	<1
Reflection loss	dB	>55
Polarization dependence	dB	<0.1
Repeatability	dB	<0.02
Switch time	mS	<3
Switch Option		2X1 (can define manual or automatic mode)
Type of optical connector		SC/APC
Fiber type		Single mode
Network management interface		WEB+SNMP
Power supply	V	90~265Vac
		-30~ -72Vdc
Consumption	W	≤2
Working Temperature	℃	0～50
Storage temperature	℃	-20～85
Working relative humidity	%	20%～85%
Size(WxDxH)	mm	435×365×45

FWT-2600C Series SAT-TV+CATV Optical Transmitter, 47∽2410MHz,Rack Depth:260mm
FWT-2600 Series SAT-TV Optical Transmitter, 950∽2410MHz,卫星电视光发射机



Production Description

FWT-2600C series SAT-TV + CATV optical transmitters work at bandwidth of both 47~2410MHz.Being able to work independently at bandwidth of 950~2410MHz, FWT-2600C can transmit CATV signal and the whole L-Band satellite signal (SAT-IF) received by LNB into optical signal, thus achieving transparent transmission of high quality in long distance through fiber. FWT-2600C series is a combination of high technology of CATV and satellite L-Band optical fiber link products, which provides the lowest cost solution in the market for the network providers.

Product Features

- High quality: original system optimization control technology and RF pre-distortion technology ensure that the system can acquire the maximum CTB, CSO, and SBS targets in the case of excellent performance CNR.
- Rack Depth:260mm, fits for small cabinet.
- Can provide the same satellite with two polarized power supply options either with: 0 / 13 / 18Vdc.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.
- FWT-2600C series 1550nm SAT-TV + CATV optical transmitter, suitable for 10~50KM long distance transmission.

Product Series

FWT-2600C Series : SAT-TV + CATV

FWT-2600C-10, 1 way output 10dBm

FWT-2600C-2x6.5, 2 ways output 6.5dBm

FWT-2600 Series : SAT-TV

FWT-2600-10, 1 way output 10dBm

FWT-2600-2x6.5, 2 ways output 6.5dBm

Technical Parameters

Item	Unit	Parameter
Laser Type		DFB
Wavelength	nm	1550±10
Side Mode Suppression Ratio	dB	≥45
Noise Equivalent Intensity	dB/Hz	≤-145
Optical Modulation		Direct
Optical Output Power	dBm	10(or 2x6.5)
Return Loss	dB	≥50
Optical Fiber Connector		SC/APC
SAT-TV IF Performance		
Work Bandwidth	MHz	950~2410
Input Level	dBmv	5~15
Flatness	dB	±1.0
Input Impedance	Ω	75
Input Return Loss	dB	>12
Provide feed power supply	Vdc	0 / 13 / 18
FWT-2600C Series CATV Parameter		
Frequency Range	MHz	47~865
C/N	dB	≥51.0
Flatness	dB	±0.75
RF Input Level	dBuV	77~83
C/CTB	dB	≥65.0
C/CSO	dB	≥65.0
RF Input Impedance	Ω	75
RF Input Return Loss	dB	>16
General Parameter		
Power supply	V	90~265Vac
		-30~ -72Vdc
Power	W	≤15
Working Temperature	℃	0~50
Storage temperature	℃	-20~85
Working relative humidity	%	20%~85%
Size(WxDxH)	mm	435×260×45

FWR-XGS-2600W, SAT-TV+CATV & XGS-PON WDM Optical Receiver
FWR-2600W,SAT-TV+CATV & PON WDM Optical Receiver



Production Description

FWR-XGS-2600W series optical receiver is a FTTH CATV+SAT-TV high-performance optical transmission equipment, suitable for cable TV and satellite live TV transmission on the same network. This machine selects the high bandwidth, high sensitivity photoelectric cell, and low noise matching circuit, all Shen gallium IC amplifier, light receiving range - 15 ~ + 2dBm, electric AGC: 0 ~ -12dBm/ RF80dBuv constant output. For the convenience of users, the machine is also equipped with working power and light power receiving and monitoring LED indicator light on the panel.

FWR-XGS-2600W is an optical receiver which can meet the needs of FTTH fiber to household in SAT-TV+CATV & XGS-PON optical network to receive 1550nm SAT-TV+CATV signal and output XGS-PON signal (1310/1490nm & 1270/1577nm). FWR-XGS-2600W is a WDM optical receiver with XGS-PON interface.

Product Features

- FWR-XGS-2600W Optical Receiver Compatible with HUAWEI OptiXstar S890H / P871E XGS-PON ONU, achieving XGS-PON & Wavelength multiplexing of RF video (SAT-TV+-CATV) in FTTH GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON networks.
- Wide bandwidth type: 47 ~ 2410MHz working bandwidth.
- One fiber can receive Analog TV, Digital TV (DVB-C), Satellite TV (DVB-S) signal and CATV radio frequency RF signal at the same time.
- FWR-XGS-2600W Optical Receiver can be used along with the FULLWELL 1550nm SAT-TV+CATV optical transmitter and XGS-PON & SAT-TV+CATV WDM EDFA / Combiner for FTTH triple play transmission and coverage.
- Industry-leading 5V power adapter, non-stop work design for more than 5 years.

Product Series

FWR-XGS-2600W， XGS-PON & SAT-TV+CATV WDM Optical Receiver
FWR-2600W， PON & SAT-TV+CATV WDM Optical Receiver

Technical Parameters

Item		Description	Remark
Input Optical Power Range		-15~+2dBm	
		AGC:-12~0dBm	
Responsivity		≥0.9A/W	
Optical Return Loss		≥55dB	SC/APC
Input wavelength		1310/1490 & 1270nm/1577nm	FWR-XGS-2600W
		1310/1490nm	FWR-2600W
Output wavelength		1310/1490 & 1270/1577nm	FWR-XGS-2600W
		1310/1490nm	FWR-2600W
Receive Wavelength		1540~1560nm	
Frequency Range		45-2410MHz	CATV & SAT-TV
CATV	Flatness	±1.0dB(47~1000MHz)	
	Output Level	AGC:80dBμV	1 way output (AGC:-12~0dBm)
		AGC:76dBμV	2 ways output (AGC:-12~0dBm)
	CNR/CSO/CTB	≥50dB/≥60dB/≥65dB	-1dBm input power
	MER/BER	≥32(64QAM)/≤1×10-4	-12dBm
	Return Loss	≥14dB(47~1000MHZ)	Output Impedance/75Ω
	AGC Stability	±1dB(-12~0dBm)	
SAT-IF	Flatness	±1.5dB(950~2410MHz)	It varies with the input level.
	Output Level	≥80dBuv	-12~0dBm/AGC
	Return Loss	≥10dB(950~2410MHz)	Output Impedance/75Ω
	AGC Stability	±1dB(-12~0dBm)	
RF Connector		F-female	
Optical Connector		SC/APC	
XGS-PON Connector		SC/APC or SC/UPC	Depending on the user's choice
Power Supply		5V/500mA	AC90~255V→DC5V
Power Consumption		<2.5W	
Working storage temperature		-5~45°C/-25~75°C	5~90 (Non-condensation)
Dimension		92×80×25mm	Aluminum box structure

FWR-2600 SAT-TV+CATV Optical Receiver
卫星电视+CATV光接收机





Production Description

FWR-2600 optical receiver is an FTTH CATV+SAT-TV high-performance optical transmission equipment, suitable for cable TV and satellite live TV transmission on the same network. This machine selects the high bandwidth, high sensitivity photoelectric cell, and low noise matching circuit, all Shen gallium IC amplifier, light receiving range - 15 ~ + 2dBm, electric AGC: 0 ~ -12dBm/ RF80dBuv constant output. For the convenience of users, the machine is also equipped with working power and light power receiving and monitoring LED indicator light on the panel. FWR-2600 is an optical receiver which can meet the needs of FTTH fiber to household in CATV+SAT-TV optical network.

Product Features

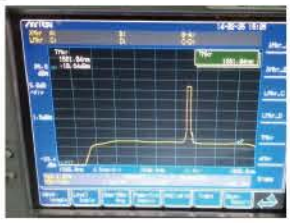
- Wide bandwidth type: 47 ~ 2410MHz working bandwidth.
- One fiber can receive Analog TV, Digital TV (DVB-C), Satellite TV (DVB-S) signal and CATV radio frequency RF signal at the same time.
- FWR-2600 Optical Receiver can be used along with the FULLWELL 1550nm SAT-TV+CATV optical transmitter and CATV EDFA for FTTH optical network.
- Industry-leading 5V power adapter, non-stop work design for more than 5 years

Technical Parameters

Item		Description	Remark
Input Optical Power Range		-15~+2dBm	
		AGC:-12~0dBm	
Responsivity		≥0.9A/W	
Optical Return Loss		≥55dB	SC/APC
Input wavelength		1550/1310nm	
Frequency Range		45-2410MHz	CATV & SAT-TV
CATV	Flatness	±1.0dB(47~1000MHz)	
	Output Level	AGC:80dBμV	1 way output (AGC:-12~0dBm)
		AGC:76dBμV	2 ways output (AGC:-12~0dBm)
	CNR/CSO/CTB	≥50dB/≥60dB/≥65dB	-1dBm input power
	MER/BER	≥32(64QAM)/≤1×10-4	-12dBm
	Return Loss	≥14dB(47~1000MHZ)	Output Impedance/75Ω
	AGC Stability	±1dB(-12~0dBm)	
SAT-IF	Flatness	±1.5dB(950~2410MHz)	It varies with the input level.
	Output Level	≥80dBuv	-12~0dBm/AGC
	Return Loss	≥10dB(950~2410MHz)	Output Impedance/75Ω
	AGC Stability	±1dB(-12~0dBm)	
RF Connector		Female	
Optical Connector		SC/APC	
Power Supply		5V/500mA	AC90~255V→DC5V
Power Consumption		<2W	
Working storage temperature		-5~45°C/-25~75°C	5~90 (Non-condensation)
Dimensions		92×80×25mm	Aluminum box structure

FWA-1550D Series Gain Flat Type C-Band DWDM Booster EDFA
Rack Depth:260mm,增益平坦型电信多通道BA功率型光纤放大器







Production Description

FWA-1550D series booster type DWDM EDFA is a telecommunication multi-channel C-band power fiber amplifier, that is, a flat gain amplifier for each channel. The product uses advanced electronic control technology and complete software functions. It has a wide operating wavelength range, low noise, excellent gain flatness. The output power of the transmitting end of the digital signal is input to the 1550D series power optical fiber amplifier after wavelength multiplexing in the DWDM system, which can increase the transmitted optical power and extend the long-haul transmission distance.

Product Features

- High quality: adopt multimode large power pump laser, power is optimized reasonably by software, and can maximumly reduce NF of EDFA, it is comparable with EDFA. The feature can make system achieve excellent CNR.
- FWA-1550D series Rack Depth:260mm, fits for small cabinet.
- The working wavelength is C band, which meets the communication technology requirements of DWDM systems.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.

【Application】

(1) DWDM Power amplify.
(2) DWDM Optical distribution system.
(3) SDH,ATM long distance transmission .
(4) Video, Ethernet optical transmission system .etc.

Technical Parameters

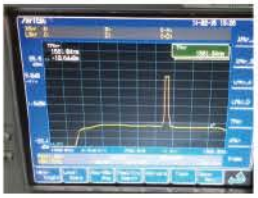
Item		Specification
Operation wavelength	nm	1538~1565
Input optical power range	dBm	-10~ +10
Nominal optical input power	dBm	+3
Saturated output power	dBm	18~25
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Polarization dependence loss	dB	<0.3
Polarization dependence gain	dB	<0.4
Polarization mode dispersion	ps/nm	<0.3
Input/output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Optical connector		SC/UPC or LC/UPC
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	≦10
Working temp.	℃	0~65
Storage temp.	℃	-40~80
Relative humidity	%	5~95
Size(WxDxH)	mm	435×260×45

Product Series

FWA-1550D -18 output power, ≥18dBm (63mW)
FWA-1550D -19 output power, ≥19dBm (80mW)
FWA-1550D -20 output power, ≥20dBm (100mW)
FWA-1550D -21 output power, ≥21dBm (125mW)
FWA-1550D -22 output power, ≥22dBm (160mW)
FWA-1550D -23 output power, ≥23dBm (200mW)
FWA-1550D -24 output power, ≥24dBm (250mW)
FWA-1550D -25 output power, ≥25dBm (320mW)

FWA-1550L Series Gain Flat Type Line Amplifier DWDM C-Band EDFA
Rack Depth:260mm,电信中继增益平坦型LA光纤放大器







Production Description

FWA-1550L series DWDM EDFA is a telecommunication long-distance transmission optical fiber amplifier. It is mainly installed in the middle section of long-haul transmission. It has ultra-low optical input power of -30dBm, and it is amplified to + 25dBm output to improve the sensitivity of the digital signal at the receiving end, so that to achieve the purpose of extending the signal for long-haul transmission.

FWA-1550L series DWDM EDFA is a telecommunication multi-channel C-band power fiber amplifier. The product uses advanced electronic control technology and complete software functions. It has a wide operating wavelength range, low noise, excellent gain flatness.

Product Features

- High quality: adopt multimode large power pump laser, power is optimized reasonably by software, and can maximumly reduce NF of EDFA, it is comparable with EDFA. The feature can make system achieve excellent CNR.
- Through advanced electronic control technology, complete software functions and optimized the optical path, which allows EDFA has ultra-low optical input power of -30dBm and then amplified to + 25dBm output, so that to achieve the purpose of extending the signal for long-haul transmission.
- The working wavelength is C band, which meets the communication technology requirements of DWDM systems.
- FWA-1550L series Rack Depth:260mm, fits for small cabinet.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000.

【Application】 (1) Line amplify.
(2) Power amplify.
(3) Optical distribution system.
(4) SFP, SDH, ATM long-haul transmission.
(5) Video, Ethernet optical transmission system

Technical Parameters

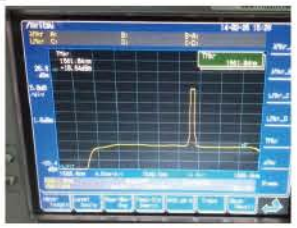
Item		Specification
Operation wavelength	nm	1538~1565
Input optical power range	dBm	-30~ -10
Nominal optical input power	dBm	-25
Saturated output power	dBm	13~25
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Polarization dependence loss	dB	<0.3
Polarization dependence gain	dB	<0.4
Polarization mode dispersion	ps/nm	<0.3
Input/Output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Optical connector		SC/UPC or LC/UPC
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	≤12
Working temp	℃	0~65
Storage temp.	℃	-40~80
Relative humidity	%	5~95
Size(WxDxH)	mm	435×260×45

Product Series

FWA-1550L-13 output power, ≥13dBm (20mW)
FWA-1550L-14 output power, ≥14dBm (25mW)
FWA-1550L-15 output power, ≥15dBm (32mW)
FWA-1550L-16 output power, ≥16dBm (40mW)
FWA-1550L-17 output power, ≥17dBm (50mW)
FWA-1550L-18 output power, ≥18dBm (63mW)
FWA-1550L-19 output power, ≥19dBm (80mW)
FWA-1550L-20 output power, ≥20dBm (100mW)
FWA-1550L-21 output power, ≥21dBm (125mW)
FWA-1550L-22 output power, ≥22dBm (160mW)
FWA-1550L-23 output power, ≥23dBm (200mW)
FWA-1550L-24 output power, ≥24dBm (250mW)
FWA-1550L-25 output power, ≥25dBm (320mW)

FWA-1550C Series C-Band Pre Gain Flat Type DWDM EDFA
Rack Depth:260mm,电信前置增益平坦型PA光纤放大器







Production Description

FWA-1550C DWDM EDFA (Erbium Doped Fiber Amplifier) is a C-band pre-amplifier, which is mainly installed in front of the receiving device. Ultra-low input optical power and then amplifies the optical power to improve the sensitivity of transmitting and receiving equipment, so that to achieve the purpose of extending the signal for long-haul transmission.

FWA-1550C series gain fiber pre-amplifier uses advanced electronic control technology and complete software functions. By optimizing the optical path, it has a wide operating wavelength range, low noise, and excellent gain flatness characteristics.

Product Features

- With excellent optical performance, advanced electronic control technology and complete software functions, the system can obtain excellent CNR by optimizing the optical path and minimizing the NF of EDFA.
- The working wavelength is C band, which meets the communication technology requirements of DWDM systems.
- FWA-1550C series Rack Depth:260mm, fits for small cabinet.
- Support: IPv4 and IPv6, WEB and SNMP, Fullwell Network Management System Solutions FW2000

【Application】

(1) Line amplify.
(2) Power amplify.
(3) Optical distribution system.
(4) SFP, SDH, ATM long-haul transmission.
(5) Video, Ethernet optical transmission system

Technical Parameters

Item		Specification
Operation wavelength	nm	1538~1565
Input optical power range	dBm	-30~ -15
Nominal optical input power	dBm	-25
Saturated output power	dBm	-5~+5
Difference of each output power	dB	-0.5~+0.5
Output power adjustable range	dBm	-3~0
Noise figure (Pin=0dBm)	dB	4.5~5.0
Polarization dependence loss	dB	<0.3
Polarization dependence gain	dB	<0.4
Polarization mode dispersion	ps/nm	<0.3
Input/output isolation	dB	>30
Pump power leakage	dBm	<-30
Echo loss	dB	>55
Network management interface		WEB+SNMP
Optical connector		SC/UPC or LC/UPC
Power supply	V	90~265Vac
		-30~ -72Vdc
Power consumption	W	≦12
Working temp	℃	0~65
Storage temp.	℃	-40~80
Relative humidity	%	5~95
Size(WxDxH)	mm	435×260×45

FWG-890G, GPON ONU, 1xGE HGU, USB 5V/500mA,
可以通过烽瑞FWR-XGS-8610RWU分波光接收机的USB供电一起使用





Production Description

FWG-890G single-user ONU is designed for ONU in different FTTH solutions, The carrier-class FTTH application provides date service access.

FWG-890G adopts high-performance and low-consumption chips, and supports CTC V2.0 interconnection and inter-working standard of China Telecom. With the help of NGBN View NMS, it can provide subscribers with abundant services, and totally meet the needs of carrier-class FTTH devices.

FWG-890G is designed by ZTE chipset,Small size, suitable for installation in various occasions.

FWR-XGS-8610RWU XGS-PON & CATV WDM Optical Receiver with USB Output 5V/500mA, can be used together.

Product Features

- Router mode supports PPPoE / DHCP / static IP
- Support port-based rate limitation and bandwidth control
- In compliant with ITU-T G.984 Standard
- Up to 20KM transmission Distance
- Support data encryption, group broadcasting, port VLAN separation, etc.
- Support Dynamic Bandwidth Allocation (DBA)
- Support IPv4 &IPv6
- Support ONU auto-discovery/Link detection/remote upgrade of software
- Support VLAN division and user separation to avoid broadcast storm
- Support power-off alarm function, easy for link problem detection
- Support broadcasting storm resistance function
- Specialized design for system breakdown prevention to maintain stable system
- Support software online upgrading EMS network management based on SNMP, convenient for maintenanc

Technical Parameters

Item		Parameter
Interface	PON Interface	1 GPON optical interface Meet Class B+ standard Upstream 1.244Gbps, downstream 2.488Gbps SC/UPC single-mode fiber split ratio:1:128 Transmission distance 20KM
	User Ethernet Interface	1*10/100/1000M auto-negotiation Full/half duplex mode RJ45 connector 100m distance
	Power Interface	5V/500mA Type-C Power supply
Performance Parameters	PON Optical Parameter	Wavelength: Tx 1310nm, Rx1490nm Tx Optical Power:0.5～+5dBm Rx Sensitivity: -27dBm Saturation Optical Power: -8dBm Connector Type: SC/UPC Optical Fiber: 9/125μm single-mode fiber
	Data Transmission Parameter	Packet Loss Ratio:<1*10E-12 latency: <1.5ms
	Gateway	Router mode supports PPPoE / DHCP/ static IP WAN support Router and Bridge mode WAN support Internet LAN supports DHCP and static IP Support NAT and NAPT

	Business Capability	Layer 2 wire speed switching Support VLAN TAG/UNTAG, VLAN conversion Support Port-based speed limitation Support Priority classification Support storm control of broadcast
Network Management	Management Mode	Support ITU-T G.984 OMCI, ONU can be remotely managed by OLT Support Remote management through Telnet or http Local management
	Management Function	Status monitor, Configuration management, Alarm management, Log management
	Management Function	Status monitor, Configuration management, Alarm management, Log management
Indicator	LED Indicator	PWR: Power up or down LOS: Optical Link Status PON: ONU Registered LINK/ACT: Link Status of Ethernet Interface
Physical Features	Shell	Plastic casing
	Power	External 5V/ 500mA Type-C power supply Power consumption: <2W
	Physical Specifications	Item Dimension: 92mm(L) x 21.5mm(W) x 17mm (H) Item weight: 0.03kg
	Environmental Specifications	Operating temperature: -20 to 70 ºC Storage temperature: -40 to 85 ºC Operating humidity: 10% to 90% (Non-condensing) Storage humidity: 10% to 90% (Non-condensing)

FWXG-890SG, XGS-PON ONU, 10GE+2.5GE XGS-PON SFU

Production Description

FWXG-890SG XGS-PON ONU is best suited for FTTH residential applications.It provides customers 1x10GE Ethernet data and 1x2.5G Ethernet data.
FWXG-890SG Equipped with ITU-T G.9807.1 compliant 10G Downstream and 10G Upstream XGS-PON interface, FWXG-890SG supports the full Triple Play of services including voice, video, and high speed internet access service.
Compliant with standard OMCI definition, FWXG-890SG is manageable at remote side and supports the full range FCAPS functions including supervision, monitoring and maintenance.



Product Features

- ITU-T G.9807.1 XGS-PON BoB Uplink.
- 1x 100/1000/2.5G/5G/10GBASE-T IEEE 802.3ab/bz/an Ethernet RJ45 ports.
- 1x 100/1000/2.5GBASE-T IEEE 802.3ab/bz Ethernet RJ45 ports.
- Wall adaptor.
- 0 to 40°C operating temperature.
- Industry-leading 12V power adapter, non-stop working design for more than 5 years.

Technical Parameters

General	
FULLWELL Solutions Model	FWXG-890SG
ONT Type	XGS-PON SFU
Main SoC	Intel PRX321
Uplink	XGS-PON
Downlinks	1x 10GE, 1x 2.5GE
Operating Temperature	0 to 40°C
Operating Humidity	10% to 95%，non-condensing
Dimensions	145X110X30mm
Installation	Desktop
Weight	220g
Regulatory	ETL, CE and FCC

XGS-PON	
PON Interface	ITU-T G.9807.1 BoB

2.5GE LAN	
Ethernet Interface	RJ45 connectors
Standard Compliance	IEEE 802.3, 802.3u, 802.3ab
Link	Half-duplex and full-duplex operations; 10/100/1000/2.5G BaseT auto-negotiation and manual configuration; MDI/MDIX auto detection

10G LAN	
Ethernet Interface	RJ45 connector
Standard Compliance	IEEE 802.3u, 802.3ab, 802.3bz, 802.3an
Link	100M/1000M/2.5G/5G/10GBaseT auto-negotiation and manual configuration; Half-duplex and full-duplex operations for 100/1000BaseT; MDI/MDIX auto detection for 100/1000BaseT

Layer-2Bridging	
MAC	Ethernet frame filtering based on port, SA/DA IEEE 802.3as, Max MTU size 2000bytes MAC address limiting
VLAN	IEEE 802.1d bridging Ingress/egress IEEE 802.1p tagging, replacement, and striping IEEE 802.1ad Double tagging
	Traffic class forwarding to GEMPort and TCONT
QoS	QoS based on 802.1p and 802.1q 802.1p marking based on DSCP
Multicast	IGMP v2, v3, IGMP snooping

OAM	
LEDs	Power, PON, LOS, 10GE, 2.5GE
Management	OMCI, CLI, Telnet
Firmware Upgrade	Firmware upgrade, active and alternative firmware images
Diagnostics	Enhanced GPON debug and diagnostic functions Remote debug via telnet from OLT Log files, memory allocation and crash check
Alarm	Alarm report and suppression (ARC)
PM	All standard PM counters

Power	
Power Options	Wall adapter
Wall Adapter/BBU	100-240VAC in, 50/60Hz 12VDC out, 1A max

FWG-HGU810GC, 1xGE+CATV , XPON HGU, 1GE ONU带CATV RF

Production Description

FWG-HGU810GC ONT supports CATV module, it can convert CATV optical signals into electrical RF signals. FWG-HGU810GC is a residential gateway device with routing functions for xPON ONU and LAN Switch for residential and SOHO users, which is in line with ITU-T G.984 and IEEE802.3ah.

The uplink of FWG-HGU810GC provides one PON interface, while downlink provides one Ethernet and RF interface. It can realize optical access solutions such as FTTH (Fiber To The Home) and FTTB (Fiber To The Building). It fully integrates the reliability, maintainability and security design of carrier-grade equipment, and provides customers with the last kilometer of broadband access to residential and corporate customers.



Product Feature

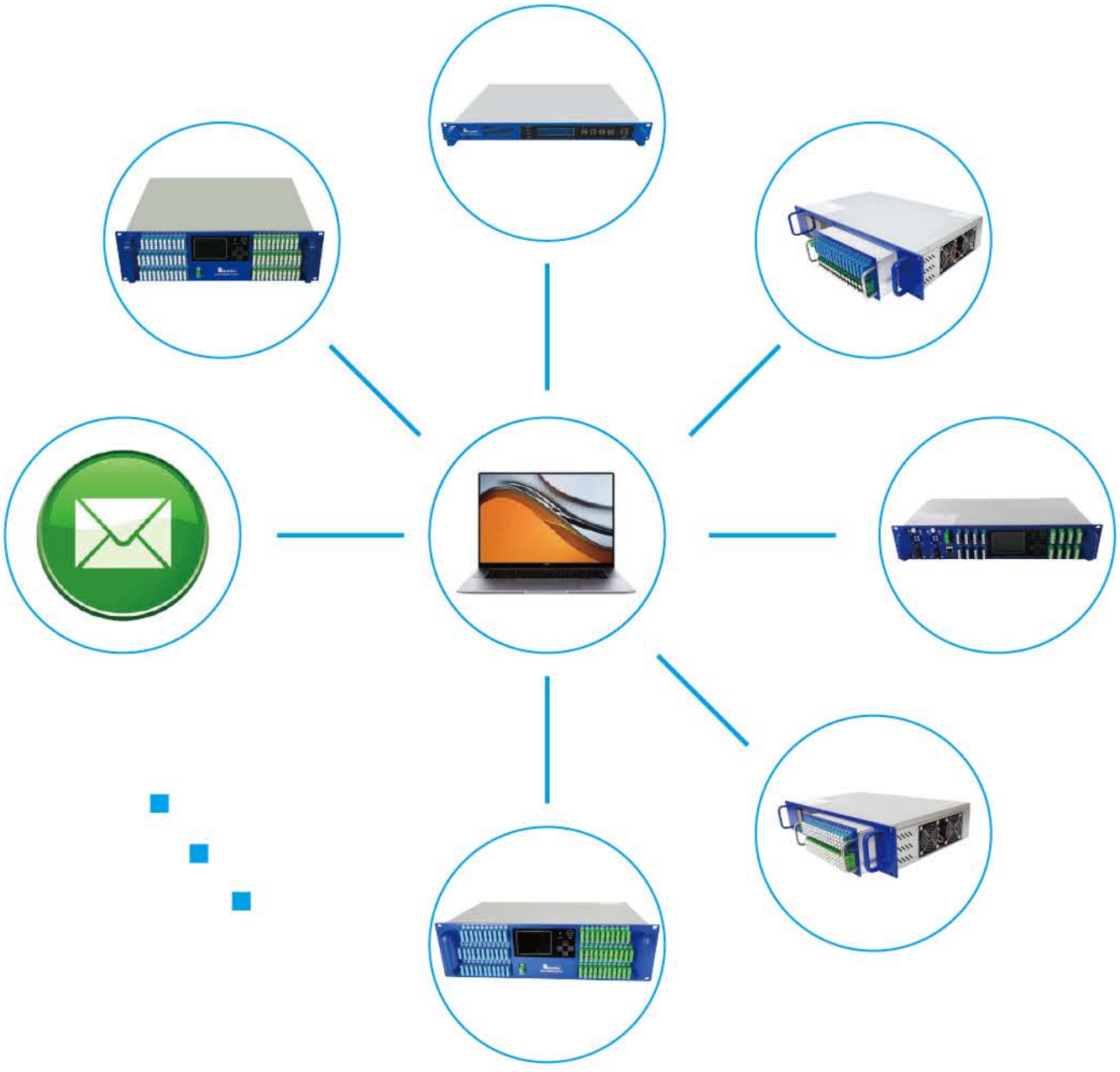
- Compliance with IEEE 802.3ah(EPON) & ITU-T G.984.x(GPON) standard
- Support IPV4 & IPV6 Management and transmission
- Support Layer 3 gateway with hardware NAT
- Support Multiple WAN with Route/Bridge mode
- Support Layer 2 802.1Q VLAN, 802.1P QoS,ACL etc
- Support IGMP V2 and MLD proxy/ snooping
- Support DDNS, ALG, DMZ, Firewall and UPNP service
- Support CATV interface for video service
- Support bi-directional FEC
- Support docking compatibility with OLT of various manufacturers
- Support automatically adapt to the EPON or GPON mode used by the peer OLT
- Support multiple wan configuration
- Support WAN PPPoE/DHCP/Static IP/Bridge mode.
- Support CATV video service
- Support fast transmission of hardware NAT

Technical Parameters

Item		unit	indicators
Optical SPEC	Working wavelength	nm	PON：TX1310，RX1490;CATV：1550
	The light emitting power	dBm	1 ~ +4(xPON)
	Transmission distance	km	0~20
	Transmission rate	Gbps	GPON: Up 1.244Gbps； Down 2.488Gbps EPON: Up 1.244Gbps； Down 1.244Gbps
	The light receiving sensitivity	dBm	⩾ -27
	Optical fiber connector	/	SC/APC
	CATV optical power range	dBm	+2～-18
	CATV optical reflection loss	dB	⩾45
	CATV responsivity	A/W	⩾0.9 @1550nm
RF SPEC	Broadband/roughness	MHz/dB	45～1000/⩽ ±1.5（@-15～-10dBm）
	Output level	dBuv	⩾80±1.5 (@-12～-2dBm, 3.5%)
	Reflection loss	dB	⩾14（75Ω）
	CNR/MER	dB	⩾45/32（-9dBm，PAL-D 60CH，OMI3.8%）
	CTB/CSO/HUM	dB	⩾60/⩾60/⩾46
Other Port	The user side Ethernet ports	/	1GE
	RF output interface	/	1RF(F head metric or inch)
KEY/Button	/	/	Reset Key
Other	power supply	V/A	AV110～255V→DC12V 0.5A
	Working Environment	℃	-10℃ ~ 45℃
	Environment humidity	℃	5% ~ 95%
	Indicator light:	/	PWR/PON/LOS/LAN/ /RF
	Dimension	mm	88 x 88 x 28
	Net Weigh	Kg	0.11

FULLWELL Network Management System FW2000
烽瑞网络管理系统FW2000

FULLWELL Network Management System FW2000, has made development and improvement over the past a few years. The scope of managing equipment now includes 1550 external modulation transmitter, direct modulation optical transmitter, XGS-PON & CATV WDM EDFA, CATV EDFA and etc. The system can perform equipment' s configuration management, performance management, and alarm management, which achieves real-time parameter collecting, email notification for alarm and real-time remote controlling.



XGS-PON and RF Video Overlay (CATV) in FTTH Network Solutions

CATV

CATV RF



1550nm Optical CATV Transmitter
FWT-1550DT-10

HUAWEI
Enterprise Partner
Solution
CERTIFIED
NO.20210111CN0370

Internet



HUAWEI OLT XGS-PON EA5800-X7

1550nm CATV

1310/1490nm & 1270/1577nm



FWAP-XGS Series XGS-PON & CATV WDM EDFA / Combiner

Mixed Output: 1310/1490nm & 1270/1577nm + 1550nm

FTTH
The utilization of three or five wavelengths by using just one optical fiber.

Splitter

FWAP-XGS series XGS-PON & CATV WDM EDFA / Combiner can also be integrated into point-to-multipoint such as GPON, 10GPON, XGPON, XGSPON, NGPON2, GEPON, Ethernet PtP & Wavelength multiplexing of RF Video Overlay (CATV) in FTTH xPON networks solutions.

Solution 1

XGS-PON ONU
& XGS-PON WDM Optical Receiver



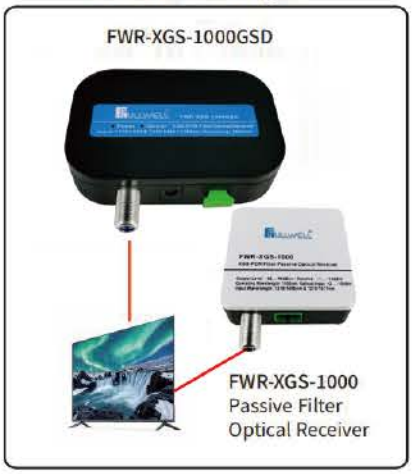
Solution 2

XGS-PON & CATV WDM Optical Receiver
+ XGS-PON ONU



Solution 3

XGS-PON Filter Optical CATV Receiver
1550nm CATV Signal



XG(S)-PON and RF Video Overlay (CATV+SAT-TV) in FTTH Network Solutions



SAT-IF 950~ 2410MHz ⇩⇩ CATV RF



1550nm Optical CATV+SAT-TV Transmitter
FWT-2600C-10

HUAWEI
Enterprise Partner
Solution
CERTIFIED
NO.20210111CN0370



HUAWEI OLT XG(S)-PON EA5800-X7

1550nm CATV+SAT-TV

1310/1490nm & 1270/1577nm



XGS-PON & CATV + SAT-TV WDM EDFA / Combiner

Mixed Output: 1310/1490nm & 1270/1577nm + 1550nm

FTTH

The utilization of three or five wavelengths by using just one optical fiber.

Splitter

FWAP-1550H series PON & CATV WDM EDFA / Combiner can also be integrated into point-to-multipoint such as GPON & Wavelength multiplexing of RF Video Overlay (CATV) in FTTH PON networks solutions.

Solution 1

GPON ONT with CATV+SAT-TV RF

FWG-HGU8020WCS
1GE+1FE+WIFI+CATV+SAT-TV



Solution 2

XGS-PON & CATV+SAT-TV WDM Optical Receiver + XGS-PON ONU

FWR-XGS-2600W



HUAWEI
OptiXstar S890
XGS-PON 1*10GE

Solution 3

Filter Optical CATV+SAT-TV Receiver

FWR-XGS-2600D
1550nm CATV+SAT-TV Signal



Wide Bandwidth:
47~2410MHz

PON & CATV WDM EDFA / Combiner for RF Video Overlay and PON Networks Solutions

CATV



1550nm Optical CATV Transmitter
FWT-1550DT-10

HUAWEI Enterprise Partner Solution CERTIFIED
NO.20210111CN0370

Internet



HUAWEI OLT PON EA5800-X2

1550nm CATV

1310/1490nm



PON & CATV WDM EDFA / Combiner

Mixed Output : 1310/1490nm+1550nm

FTTH
The utilization of three wave-lengths by using just one optical fiber.

Splitter

FWAP-1550H series PON & CATV WDM EDFA / Combiner can also be integrated into point-to-multipoint such as GPON & Wavelength multiplexing of RF Video Overlay (CATV) in FTTH PON networks solutions.

Solution 1
GPON ONT with CATV RF

FWG-HGU810GC 1GE+CATV



Solution 2
PON & CATV WDM Optical Receiver + XPON ONU

FWR-8610RWU

FWR-1000W
Passive WDM
Optical Receiver



Solution 3
Filter Optical CATV Receiver

FWR-1000GSD



FWR-1000
Passive Filter
Optical Receiver

华为智能酒店解决方案与烽瑞三网融合系统

互通测试报告

江苏苏州创意产业园（华为）研发中心

二〇一三年十二月二十日

华为智能酒店解决方案与烽瑞三网融合系统

互通测试报告

编号：HWEBGOPLAB01C131219008

1 互通测试简介

1.1 测试背景

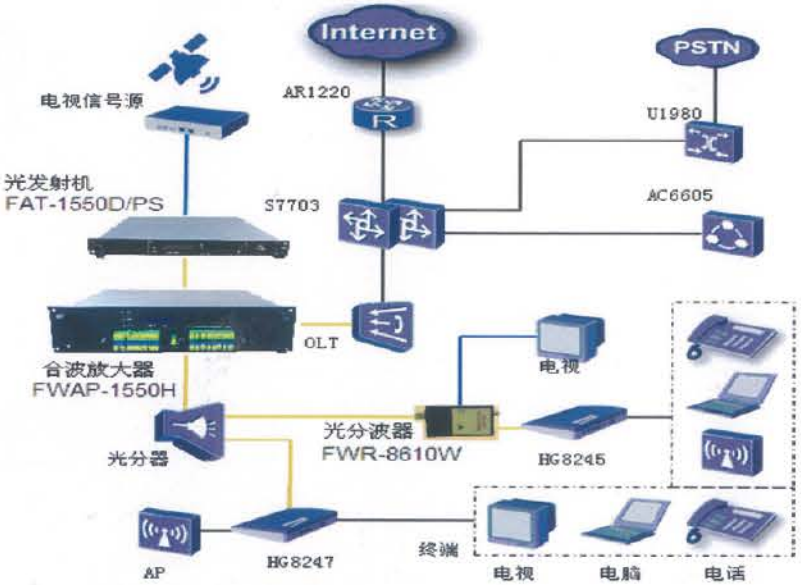
华为(HUAWEI)智能酒店解决方案旨在提升酒店的运营效率、降低酒店整体的运营成本、增加酒店盈利的机会点、提升了客户的满意度，其中全光酒店一房一线方案通过在一条光纤同时承载上网、语音、无线、电视等多种业务，实现一个房间一条光纤接入以减少工程布线，降低运营成本。

杭州烽瑞光电设备有限公司成立于2005年，位于杭州市江干科技园区，公司致力于光电设备的技术与设备的研发、生产和销售。公司在光纤CATV传输领域进行了大量的产品开发形成了一批本公司技术的核心产品。

本次测试的目的是验证电视信号经过烽瑞三网融合系统转换成光信号并合入华为全光酒店网络，满足一条光纤同时承载上网、语音、无线、电视等多种业务。

1.2 测试组网

下图为互通测试组网图，主要包括基础网络部分和电视信号接入部分，基础网络由华为提供，包括交换机、路由器、无线网络、语音网关、GPON/GEPON网络等；电视信号接入部分包括光发射机、大功率合波器、分波光接收机等。



2 互通设备信息

公司名称	设备及软件名称	型号	软件版本	互通端口类型
华为	路由器	AR1220	V200R003	网口
	交换机	S7703	V200R001	网口
	语音网关	U1980		网口
	AC控制器	AC6605	V200R003	网口
	OLT	MA5680T	V800R012	网口、光口
	光分器	1：2	-	光口
	ONT	HG8247	V100R006	光口、网口、同轴口、电话口
	ONT	HG8245	V100R006	光口、网口、电话口
	AP	AP6010	V200R003	网口
烽瑞	光发射机	FWT-1550D/PS-10	V1.21	光口、同轴口
	大功率合波器	FWAP-1550H-16X19	V5.88	光口
	分波光接收机	FWR-8610W	V1000	光口、同轴口

3 互通主要功能测试

3.1 测试结果汇总

测试类别	测试项目	测试结果
HG8247+FWAP-1550H-16X19大功率合波器场景单业务测试	有线上网业务正常，能够正常访问Internet网络资源	■passed □passed partly □failed □not test □block
	无线上网业务正常，不同SSID接入能够正常访问Internet网络资源	■passed □passed partly □failed □not test □block
	模拟电话语音业务正常，内线外线拨打正常，无杂音断线	■passed □passed partly □failed □not test □block
	电视播放业务正常，普通和高清电视正常播放，无画面失真及马赛克现象	■passed □passed partly □failed □not test □block
HG8245+FWR-8610W分波光接收机场景单业务测试	有线上网业务正常，能够正常访问Internet网络资源	■passed □passed partly □failed □not test □block
	无线上网业务正常，不同SSID接入能够正常访问Internet网络资源	■passed □passed partly □failed □not test □block
	模拟电话语音业务正常，内线外线拨打正常，无杂音断线	■passed □passed partly □failed □not test □block
	电视播放业务正常，普通和高清电视正常播放，无画面失真	■passed □passed partly □failed □not test □block

	及马赛克现象	
HG8247+ FWAP-1550H-16X19 大功率合波器场景多业务测试	电视播放与有线上网业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放与无线上网业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放与语音电话业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放、有线上网、无线上网、语音电话业务同时工作，互不影响	■passed □passed partly □failed □not test □block
HG8245+ FWR-8610W 分波光接收机场景多业务测试	电视播放与有线上网业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放与无线上网业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放与语音电话业务同时工作，互不影响	■passed □passed partly □failed □not test □block
	电视播放、有线上网、无线上网、语音电话业务同时工作，互不影响	■passed □passed partly □failed □not test □block
HG8247+ FWAP-1550H-16X19 大功率合波器场景长时间运行测试	保持系统运行24小时，电视播放、有线上网、无线上网、语音电话业务正常	■passed □passed partly □failed □not test □block
HG8245+ FWR-8610W 分波光接收机场景长时间运行测试	保持系统运行24小时，电视播放、有线上网、无线上网、语音电话业务正常	■passed □passed partly □failed □not test □block
备注： Passed—通过 passed partly—部分通过 failed—不通过 not test—未测试 block—未实现该功能		

4 结论

本次互通测试验证了华为智能酒店解决方案与烽瑞三网融合系统对接的各项功能均能实现，烽瑞三网融合系统转换的电视信号能够正常合入华为 GPON/GEPON 网络，有线上网、无线上网、语音、电视播放业务互不影响。基本功能对接测试通过，能够满足酒店一房一线、一线三波的应用需求。

公司名称：华为技术有限公司

测试人员（签字）：

公司盖章：

日期：2013-12-20

公司名称：杭州烽瑞光电设备有限公司

测试人员（签字）：

公司盖章：

日期：2013-12-20

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